Pott's Puffy Tumor: a case report and Literature Review

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Introduction: *Pott´s Inflammatory Tumor is a rare complication of a frequent pathology, such as the sinusal infectious condition, more and more unusual because of the wide use of broad-spectrum antibiotics. It is more frequent in teenagers, due to pneumatization similar to adults. It appears as an increasing front soft volume with frontal bone osteomyelitis and subperiosteal abscess.* ***Materials and methods:*** *In this work, a bibliographic review of this topic and the case of a 9-year-old patient is introduced. He had a sinusal infectious condition, which later turned into front volume increase, showed by perioperative and intraoperative images.* ***Discussion and Conclusion:*** *Subperiosteal abscess, secondary to sinusitis, is a rare complication. However, we must think of diagnosis in patients with torpid evolution and/or who have neurologic symptomatology, such as convulsions, a study with contrasted neuroimages must be performed.*

Keywords: *Pott Puffy Tumor, Sinusitis, Epidural Abscess*

INTRODUCTION

Pott´s Inflammatory Tumor, was first described in 1775 by Sir Percivall Pott. It consists of a soft volume increase -many times asymptomatic- of the frontal zone, caused by a subperiosteal abscess with compromise of the frontal bone outer tablature, with various degrees of osteomyelitis [1-10,12-15]. Generally, it appears in male teenagers as a complication of frontal sinusitis or trauma. It is less frequent its correlation with surgical procedures and even treatments, such as acupuncture [1-10,12-15]. Physiopathologically, an hematogenous spread is proposed through septic embolism to the valveless veins draining from the frontal sinus to the medula of the frontal bone [1-4,8-10,12]. Correlation with an intracranial infectious condition is frequent, both due to direct spread through the rear wall of the frontal sinus or indirectly through the aforementioned venous mechanism [1-9,12]. With less than 30 cases published, it tends to be less frequent in young boys, due to late pneumatization of the frontal, which tends to reach the size of an adult, at 12-13 years. Besides, at this age the flow of the diploic veins reach its peak [1-3,9,10,12,14,15].

MATERIALS AND METHODS

Clinical Presentation: The main clinical condition is a soft volume increase at the frontal level [1-10,12,14,15], with migraine, hinorrhea and frontal zone sensitivity [2-10,12,14,15]. 30% of patients also have an increasing periorbital volume, caused by dropping purulent content coming from the subperiosteal area [1,2,6,7,9,10,12-14]. A condition with neurologic deficit caused by the mass

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effect, with or with no symptomatology of endocranial hypertension [2,4,5,8,10,12] or by means of a sinus-cutaneous fistula [6] is less frequent.
Imagery: Parenchymatous and bone study is recommended, with computed contrasted encephalon tomography (CT), magnetic resonance imaging (MRI) and ultrasonography, as useful tools for the diagnosis and treatment planning of this pathology [2-6,9,10,12-15]. An extracranial abscess is usually reported [2-5,8,10,12-15], with various degrees of bone compromise [2-6,8,10,12-15] associated to an intracranial component generally given by an extradural abscess [2-6,8,10,12-15] and less frequently a subdural empyema [2,3,5,8,10,12-15], brain abscess [2,3,8,10,12-15] or cortical veins thrombosis [2,5,8,10,12,14,15].

Microbiology
Generally, the condition is polymicrobial, and among other we may isolate staphylococci, microaerophilic streptococci, pneumonia streptococcus, haemophilus influenzae, anaerobes, and microorganisms of the Klebsiella group [2-5,7-10,12-15].

Treatment
The treatment consists of surgical evacuation of these lesions [2-10,12-15] with no bone replacement in cases it is compromised [2-5,9,12,14], followed by antibiotic treatment for -at least- 6 to 8 weeks [2-10,12-15].

Prognosis
Surgically managed patients have a good functional prognosis, generally with full remission of the symptomatology [2,4,12]. A relapse of about 10% in published cases is described [3].

CLINICAL CASE

The patient is a 9-year-old boy, with no morbid background, with a first consultation at the Emergency Room one month -prior to the diagnosis- due to a two-day-febrile state associated with migraine and hyperemesis. His case was managed as an atypical pneumonia with outpatient antibiotic treatment. He evolved favorably for 72 hours. After that, had a generalized tonic-clonic seizure. He was taken to the Emergency Room, with a febrile condition and had a new generalized tonic-clonic seizure, with a Glasgow Coma Scale (GCS) of 7 points, after the crisis. He was intubated and admitted to UPC due to a possible meningitis. Such diagnosis was discarded after a lumbar puncture was made, with a cytochemical with normal cerebrospinal fluid (CSF), negative culture and a computed tomography (CT) which showed a left fronto-maxillary-ethmodalis pansinusitis with an obstructive ostiomeatal pattern to the left, with no intracranial lesions (Image # 1). This condition was managed with broad spectrum antibiotic treatment. The patient neurologically evolved positively, thus recovering 15 points in GCS, with no focality, after 24 hrs. After 5 days he was discharged, with antibiotic oral treatment to be completed within 7 days. During this period, he started with an intermittent disconnection condition, with prolonged 5-day crisis after he was discharged, with further tonic clonic crisis, so he went back to the consultation. He was admitted with 15 points of GCS, with no focalities and with no fever. He was hospitalized for study and an anticonvulsant treatment was started. An electroencephalogram was made, with normal results and he was discharged once again, in order to continue his outpatient study. 14 days later he started to have oppressive intermittent migraine, with neither fever nor other referred disturbances, apart from progressive development of an increasing soft volume and sensitive at a frontal level. An ultrasonography was requested, reporting a subgaleal collection, 51x33mm. Response to analgesic treatment was not satisfactory, so, he was hospitalized and examined with a contrasted encephalon CT, which reported collections with peripheral uptake. The first one was front extracranial subperiosteal, with soft parts edema; the second one was at a level extradural frontal paramedian to the right, which displaces the superior longitudinal sinus to the caudal, with erosive compromise of the Inner tablature and frontal diploe, associated to hypodensity of the frontal left white matter which suggests a vasogenic edema and a dural uptake, with an image suggesting a subdural collection regarding the same (Image # 2). Absence of a sinusal compromise in such image, compared with the uncontrasted CT previously performed is reported. Pott´s inflammatory tumor was diagnosed and the patient was taken

Image # 1. Encephalon CT of UPC, evidencing a major frontal-ethmoidomaxillary pansinusitis to the left, with no identifiable intracranial lesions.

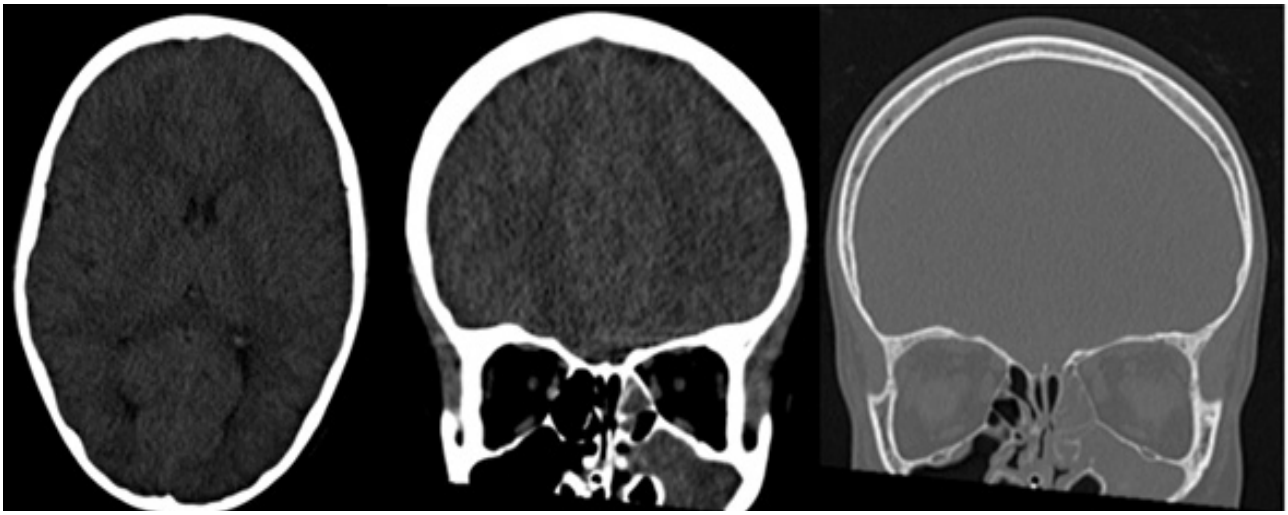
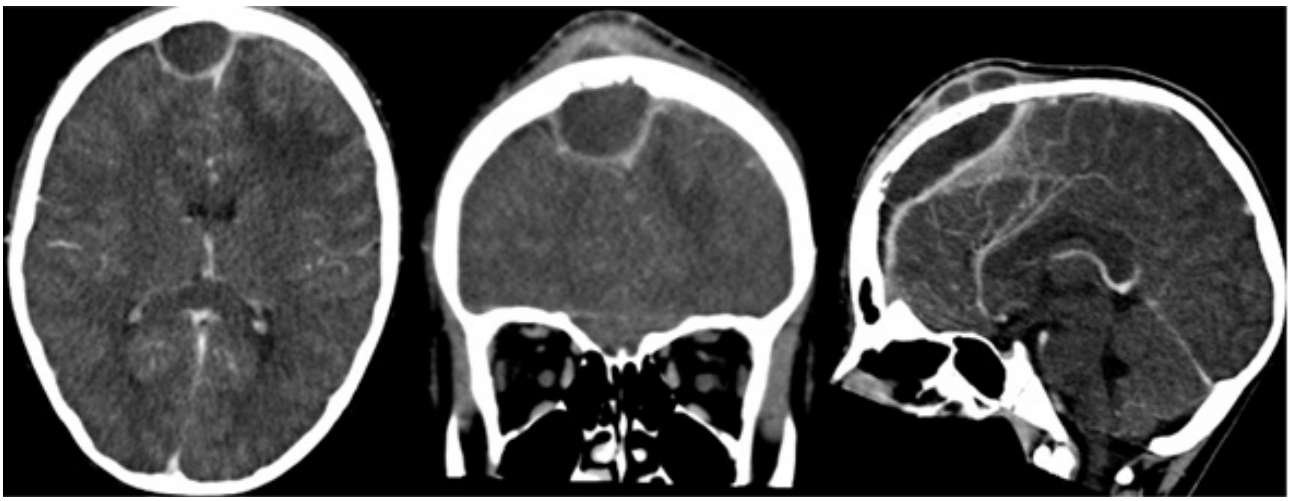


Image # 2: Contrasted Encephalon CT, with two collections, and peripheral uptake. The first one is at an extracranial frontal subperiosteal level, with associated soft parts edema. The second one was at an extradural frontal paramedian level to the right, which displaces the longitudinal upper sinus to the caudal, with an erosive compromise of the inner tablature and front diploe, associated to frontal left white matter hypodensity and to a dural uptake suggesting a collection over whether. It is important to highlight the lack of sinusal compromise in this image, against the previous one.



to the operating theater for evacuating lesions. A bicoronal incision was made, with decolaje subgaleal, showing an edematose galea, which exposed a soft volume increase at a subperiosteal level. It was punctured to drain its purulent content to be sent to culture. The compromised periosteum was dried thoroughly, thus exposing a bone with no apparent breaches. Later, a frontal craniotomy, centered in the medium line was made, thus discarding the compromised platelet, which drained abundant purulent content (Image # 3), which is evacuated with abundant normal saline solution. Dural/sinusal structures with no apparent compromise were examined. The patient was in a good postoperative condition, with no appearance of focalities.

The post-operative Encephalon CT (Image # 4) and the encephalon MR depicted a satisfactory evacuation of both collections, with no complication signals (Image # 5), Additionally, a decrease of the frontal left vasogenic edema was reported as well. A broad spectrum antibiotic treatment was started, and the culture could isolate the Streptococcus Intermedius. Currently, the patient is in good conditions, with no neurological focalities, resting at home.

DISCUSSION AND CONCLUSION

Even with the extense use of antibiotic treatments available for sinusal infectious condition, this neuro surgical complication still ha-

Image # 3. Intraoperative sight, after the craniotomy, which exposed a large extradural purulent collection.

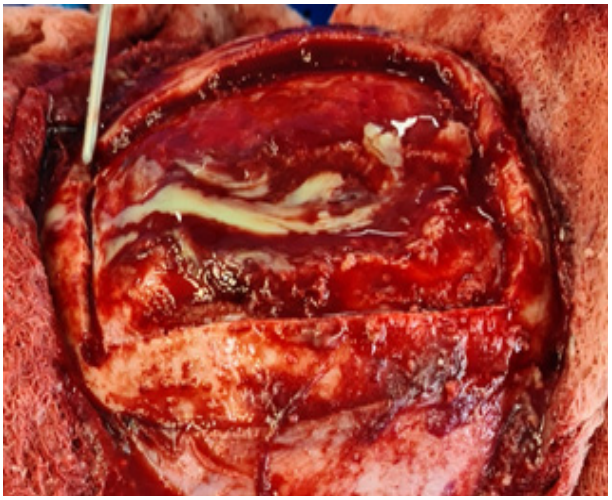


Image # 4: Immediate postoperative Encephalon CT, which depicts post-operative changes with the bifrontal craniotomy, with no platelet replacement, but with persistence of frontal left hypodensity.

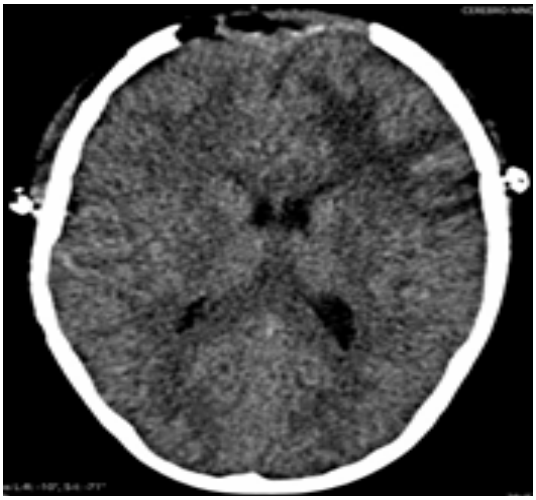
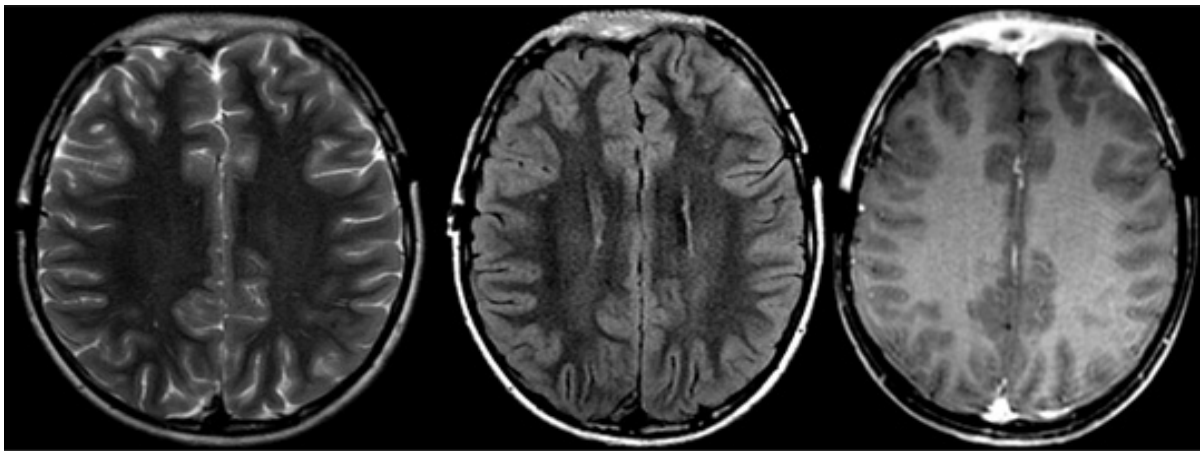


Image # 5: Postoperative encephalon MRI. A front dural thickening is observed in medium line to the left, with a doubtful frontal left subdural collection, highlighting disappearance of the frontal left vasogenic edema. T2 sequences, FLAIR and T1 GD.



ppens, even with properly managed treatments; therefore, it is necessary to highly suspect the diagnosis, surgical treatment and further early antibiotic treatment, in order to get a good functional result in these patients. Pott´s Inflammatory Tumor is an infrequent presentation of a frequent condition; therefore, all patients who have a background of a sinusal condition, have a torpid evolution or have an associated neurologic symptomatology are recommended to be examined with a contrasted neuroimage, in order to discard this type of complications.

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